

REMARKS

This application has been reviewed in light of the Office Action dated November 30, 2005. Claims 1-32 are pending in the application. By the present amendment, claims 1, 12, 13, 17, 22, 23, 26 and 31 have been amended. No new matter has been added. The Examiner's reconsideration of the rejection in view of the amendment and the following remarks is respectfully requested.

By the Office Action, the Examiner objected to claims 11, 21, and 30 as being improper dependent form for failing to further limit the subject matter of a previous claim. The Applicants respectfully disagree.

Claims 11, 21 and 30 are directed to a program storage device, which is employed to execute the methods steps of claim 1, namely, a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for analyzing circuit designs as recited in the independent claims. Claims 11, 21 and 30 are further limited since the method steps are implemented by a program storage device. The program storage device limitation is not recited in the independent claims 1, 13 and 23. The program storage device language describes the manner in which the method steps are performed and therefore further limits these methods steps.

In addition, claims 11, 21, and 30 include all of the limitations of the base claim. It is therefore, respectfully submitted that claims 11, 21 and 30 are in proper dependent form and further limit the methods of claims 1, 13 and 23, respectively and include at least all of the limitations of the independent claims from which they depend. The program storage device

executes the methods steps and therefore further limits the method claims as recited in claims 1, 13 and 23. Reconsideration is earnestly solicited.

By the Office Action, claims 1-11, 13-21 and 23-30 stand rejected under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent Application No. 2005/0066301 to Lorenz et al. (hereinafter Lorenz).

The Applicants respectfully disagree with the rejection.

Lorenz is directed to finite element methods where a mesh generation tool is integrated within a system to provide a mesh of finite elements. The finite elements may be generated for devices provided in a schematic. The mesh generation tool permits the user to act at a system level (entire design) or component level (individual component) and provide a mesh tool that works in both regimes.

Lorenz does not define properties of a portion of the circuit and render these properties as an intensity of a pixel. Instead, a mesh is generated over the entire circuit and the mesh elements are employed for a partial differential equation analysis. Lorenz uses finite element analysis and boundary element analysis to determine physical characteristics of a circuit under loading conditions, which may be assumed or generated as hypotheticals.

In stark contrast, the present invention takes a portion of a device or circuit and represents that portion as a pixel. The pixel intensity (color, shade, etc.) is employed to define the portion of the circuit/chip being represented. The pixels are employed to evaluate the design of the circuit, e.g., based on the appearance of a pixel map. Nowhere in Lorenz is such a concept disclosed or suggested. The claims as originally presented are believed to be in condition for

allowance over Lorenz since Lorenz is believed not to teach all of the elements of the claims.

However, to provide further clarification of the claims, claims 1, 13 and 23 have been amended.

Claim 1 of the present invention, includes, *inter alia*, a method for analyzing circuit designs including discretizing a design representation into pixel elements representative of a structure in the design where each pixel element represents a portion of the design, determining at least one property for each pixel element representing the portion of the design where the at least one property is represented by an intensity of the pixel element, and determining a response of the design due to local properties across the design based upon representations of the pixel elements.

The finite element method disclosed by Lorenz does not disclose or suggest discretizing a design representation into pixel elements representative of a structure in the design where each pixel element represents a portion of the design. Instead, Lorenz takes a design and overlays a mesh of finite elements over the design. Portions of the design are not discretized as pixel elements but are outlined in finite elements used as input to a PDE solver. In addition, Lorenz fails to disclose or suggest determining at least one property for each pixel element representing the portion of the design where the at least one property is represented by an intensity of the pixel element.

The intensity of these pixel elements is what is employed to be analyzed in the current claims. In other words, the design and its existing properties are reduced to a pixel element that represents these properties. Then, a map of these pixel elements (see e.g., FIGS. 4-6 of the present disclosure) is used for an analysis of the design. This is completely different from the teachings of Lorenz.

Similar reasoning is applicable to claims 13 and 23, which were amended in a similar way to claim 1 for clarification of the invention. Claims 1, 13, and 23 are therefore believed to be in condition for allowance for at least the reasons stated. Claims 2-12, 14-22 and 24-31 are also believed to be in condition for at least the stated reasons and due to their dependencies from claim 1, 13 and 23, respectively.

Other reasons may exist for allowing claims 2-12, 14-22 and 24-31 as well. For example, claims 7, 17 and 26 essentially recite that the property includes metal fraction and the global response includes thermal strain. Nowhere in Lorenz is metal fraction disclosed or suggested as a parameter or as a physical quantity used in performing calculations. This typifies the stark differences between the method of Lorenz and the present invention. While the present invention takes features of the design and reduces these features to a pixel element, Lorenz merely places a mesh on the device being analyzed and calculates physical parameters using the mesh and a PDE solver.

These differences are also highlighted in claims 10, 20 and 29 which essentially recite: representing a three-dimensional multi-layered design in two dimensions such that properties within all layers are accumulated and represented in the two-dimensional image. Several layers a design can be reduced into a two-dimensional pixel map for analysis in accordance with the present invention. This is not disclosed or suggested anywhere in Lorenz. For at least the reasons set forth above, the present claims are believed to be in condition for allowance. Early and favorable consideration is earnestly solicited.

Claim 32 has been introduced which essentially includes the subject matter of claims 1 and 12. Therefore, claim 32 is believed to be in condition for allowance as well.


The Applicant notes with appreciation the allowability of claims 12, 22 and 31 if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, in view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

The Patent Office is authorized to deduct the fee of \$250 for the additional independent claim over 3 (\$50) and additional claim over 20 (\$200) from Applicant's Deposit Account #50-0510. It is believed that no additional fees or charges are currently due. However, in the event that any additional fees or charges are required at this time in connection with the application, they may be charged to applicant's IBM Deposit Account No. 50-0510.

Respectfully submitted,

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